

Colorado Department of Health  
Hazardous Materials & Waste Management Division

Comments

on

A MANAGED APPROACH TO DEVELOPING ANALYTICAL PROGRAMS,  
SITE CHARACTERIZATION, AND REGULATORY BENCHMARKS

1. The document lists factors to consider in assessing weight of evidence for initiating second phase re-sampling and re-analysis.

- Was the analyte detected at or above the CRQL?
- Did the lab report detections below the CRQL?
- Were other related compounds detected in significant concentrations?
- Was the analyte detected in other contiguous media?

As indicated in the document, these criteria do not comprise a complete list upon which a decision to invoke an advanced phase analysis can reasonably be based. There are numerous analytes which cannot be detected at benchmark levels by CLP methods. By these criteria, anomalous concentrations could fall within these gaps between benchmark and CLP levels and be ignored by this approach. Also, because less sensitive CLP methods may yield some data that are not comparable with benchmarks, initial phase data may not be able to satisfy risk assessment requirements or support closure requirements.

2. Second phase re-sampling and re-analyzing could be costly and may take more time than is allowed in the IAG schedules if it occurs within Phase I. If DOE determines that an advanced phase is necessary, then CDH and EPA should be consulted.

3. Determination of "Precision and Accuracy Goals" should be part of the earliest decisions made in the program development process and should drive many of the other steps. Figure 2 shows this step later in the process.

4. CLP method specifications vary according to the current Statement of Work (SOW). Moreover, Colorado Hazardous Waste Regulations (6 CCR 1007-3) specify that SW-846 Second Edition methods be utilized. Alternative methods may be used when approved in a Waste Analysis Plan or via 260.21. Presently, Water/Wastewater (e.g. E218.5), SW-846, and CLP methods are proposed - each with their own peculiar and unique QC requirements, performance attributes, and specifications. Operationally, the RFI plan should minimize these variations to achieve the best data quality.

a. Metals - Clearly SW-846 method 6010 will provide adequate capability at or below the MCL's on all by arsenic, selenium and mercury. Arsenic and selenium should be analyzed by the Hydride generation technique (SW-846 methods 7741/7061). Mercury should be analyzed by the Cold Vapor technique (SW-846 method 7171).

b. Volatile/Semi-volatile organics - The RFI/RI keys in on the presence of compounds approaching extremely low concentrations. The CLP organic analytical techniques which use GC/MS typically utilize one-ion, full-scan probability based methods. This approach discriminates against low concentration analytes by allowing a high rate of false negatives, furthermore, at high concentrations these CLP methods have a propensity towards false positives. Given these two observations, CLP GC/MS organic methods should be eliminated from consideration. Attention ought to be focused on the GC/MS methods 8260 and 8270 found in SW-846 Second Edition, or, Third Edition-Revision Two which incorporate

both probability based protocols and three characteristic ion-maxima convergence based approaches.

c. Pesticide organics - The pesticide parameters in the Benchmark Tables can be grouped into four categories: Organochlorines, Organophosphates, Triazines, and Carbamates. The organochlorines/PCBs can be determined by SW-846 method 8080. The organophosphates and triazines can be determined by SW-846 method 8140 (the triazines will have to be added to the analyte list in the method specification). This group approach to analysis will be inclusive of the parameters in the benchmark tables, will minimize speculation about what could be present in the samples, and will maximize the information provided by analysis. In addition to the group analyses, confirmatory techniques should be judiciously applied to verify the group analytical data. All three of these groups can be confirmed in the acid/base-neutral extracts prepared for GC/MS SW-846 method 8270 (extract concentration techniques such as Kuderna Danish will have to be used for organochlorine pesticides to improve detection capability by GC/MS), or second column gas chromatography.

The carbamate pesticides are heat labile compounds that cannot be successfully chromatographed by gas chromatographic techniques. Most successful applications utilize High Performance Liquid Chromatography after forming the ortho-phthaldialdehyde derivative. If these species are truly of interest, the proposed method specification and performance characteristics should be offered for review and comment.

d. Herbicide Organics - The chlorophenoxyacetic acid herbicide family and their salts can be determined by SW-846 method 8150. Again, judicious application of confirmatory techniques such as GC/MS, or second column GC on their methyl esters should be applied.